

Semiclassical long wormhole throats

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Abstract

Vacuum polarization of a quantized scalar field with non-conformal coupling ξ is calculated in the background of a long wormhole throat. It is shown that the stress-energy tensor of vacuum fluctuations in this spacetime is determined by the local geometry of spacetime only. Self-consistent solutions of the semiclassical Einstein field equations describing a long throat of a traversable wormhole are obtained. © 2014 Pleiades Publishing, Ltd.

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